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Stockpile Report to the Congress

October 1981 – March 1982

FEDERAL EMERGENCY MANAGEMENT AGENCY

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Federal Emergency Management Agency
Washington, D.C. 20472

September 9, 1982

Honorable George Bush
President of the Senate

Honorable Thomas P. O'Neill, Jr.
Speaker of the House of Representatives

Sirs:

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be stockpiled in the interest of national defense to preclude a costly and dangerous dependence upon foreign sources of supply in times of national emergency.

The President delegated stockpile planning and policy activities to the Director of the Federal Emergency Management Agency. This Stockpile Report to the Congress for October 1981 - March 1982, together with a Statistical Supplement under separate cover, is submitted in accordance with section 11 of the Stock Piling Act.

Sincerely,

Louis O. Giuffrida
Director

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HIGHLIGHTS

- Metallurgical grade bauxite (1.6 million tons) is being acquired from Jamaica.
  - This is the first stockpile acquisition in which barter of agricultural products, exchange of excess stockpile materials, and cash were used in combination.
  - The total value of the transaction is $67.5 million.
- Twenty-five thousand tons of refractory grade bauxite has been purchased from China.
- Silver sales were halted pending review of requirements and method of disposal under provisions of the Department of Defense Appropriation Act.
- President Reagan announced the National Materials & Minerals Program Plan on April 5, 1982.

NATIONAL DEFENSE STOCKPILE INVENTORY

March 31, 1982

	Acquisition Cost (Billions of $)	Market Value[1] (Billions of $)
Reserved for Goals	$2.4	$7.2
Excess above Goals	1.1	$3.8
Total	$3.5	$11.0

[1] Market values are prices at which comparable materials are being traded, or in the absence of trading, values are estimates.

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NATIONAL MATERIALS AND MINERALS POLICY

On April 5, 1982, President Reagan transmitted to the Congress a report pursuant to the National Materials and Minerals Policy, Research and Development Act of 1980. In his statement of policy, the President says: "It is the policy of this Administration to decrease America's minerals vulnerability by taking positive action that will promote our national security, help ensure a healthy and vigorous economy, create American jobs, and protect America's natural resources and environment."

To implement this policy, the Administration will continue to inventory Federal land to determine its mineral availability and potential while protecting the environment. The Administration will solicit public recommendations on land use, accelerate review of Federal lands withdrawn from mineral exploration, and revoke obsolete withdrawal orders to open those lands to mining. When future withdrawal of Federal lands is proposed, a strategic and critical minerals impact analysis will be required. The Administration also seeks to eliminate barriers to development of the mineral resources of the deep seabed. The Administration will continue to collect minerals data and monitor trends, consulting with other nations to improve information exchange.

Tax incentives contained in the Economic Recovery Tax Act stimulate private research investment. Government-financed research and development activities will concentrate on long-term, high-risk, high potential payoff projects with the best chance for wide generic application to materials problems and increased productivity. The Administration will continue its review and reform of regulatory burdens on industry.

In the stockpile policy section, the Administration reaffirms endorsement of these key elements of stockpile policy:

"1. That the stockpile should be sufficient to meet the military, industrial, and essential civilian needs for the first three years of a war...."

"2. That the war scenario shall be consistent with the scenarios being developed by the Emergency Mobilization Preparedness Board...."

"3. That goals reflect detailed assumptions regarding changes in a wartime civil economy, wartime foreign trade patterns, shipping losses, wartime political and economic stability of foreign nations, and alternate foreign and domestic production levels for stockpile materials...." (These are the assumptions used for the 1980 goals.)

In regard to the pace of acquisitions, the statement says: "the Administration will expeditiously dispose of those stockpile materials held in excess of goals and acquire additional materials through the appropriations process." Two other mechanisms for acquiring materials—exchange and barter—are endorsed. Review of the quality and form of stockpiled materials will be undertaken.

In the section on stockpile alternatives, the Administration's policy is to "rely primarily on the strategic stockpile as the primary means of providing for national defense objectives. However, analysis is now ongoing to determine whether circumstances exist under which the use of Defense Production Act incentives would be more cost-effective than stockpile purchases."

It is the further policy of the Administration "that national materials policy will be coordinated through the Cabinet Council on Natural Resources and Environment" to ensure high level consideration of materials issues on a timely basis.

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CONTINUING ACTIVITIES

The Strategic and Critical Materials Stock Piling Act provides that a stock of strategic and critical materials be held to decrease dependence upon foreign sources of supply in times of emergency. Executive Order 12155 vests the primary responsibility for planning the stockpile program in the Director of the Federal Emergency Management Agency (FEMA).

The Stock Piling Act requires that the stockpile inventory be sufficient to cover U.S. needs for not less than three years of a national emergency. The President's stockpile policy guidance gives detailed assumptions regarding changes in a wartime civil economy, wartime foreign trade patterns, shipping losses, wartime political and economic stability of foreign nations, and alternate foreign and domestic production levels for stockpile materials. These guidelines are followed in determining the stockpile goals which represent the difference between estimated supply and projected requirements for each strategic material. Periodic review and updating of the goals are required by the President's policy to ensure a current estimate of our Nation's vulnerability to resource shortages during an emergency.

The stockpile inventory is compared with the goals in figure 1. Major restructuring of the stockpile inventory is necessary because most of the materials now in inventory were acquired during the 1950's. To fill the goals at March 31, 1982, prices would require purchase of additional materials valued at approximately $10.3 billion. The stockpile inventory contains $7.2 billion of the needed materials for a total goal value of $17.5 billion. Since the stockpile inventory is valued at $11.0 billion, there is an excess not held for goals of $3.8 billion.

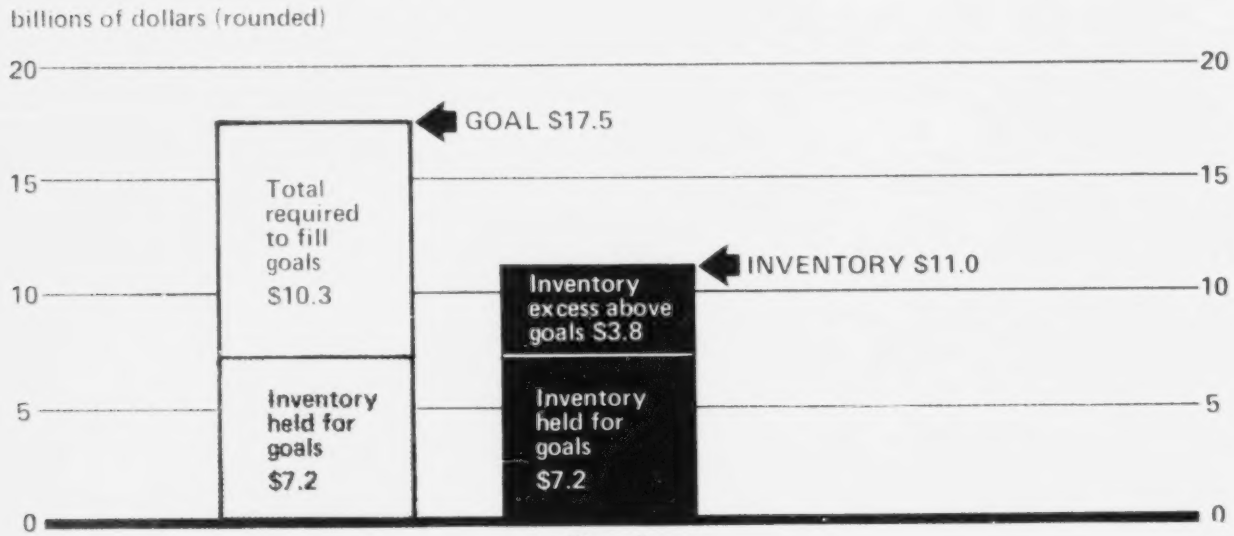

Figure 1

Restructuring of stockpile to meet goals.

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As shown in figure 2, the 61 family groups and individual materials in the stockpile can be divided into two categories:

(1) 24 groups and individual materials with inventory equal to or greater than the goals.

(2) 37 groups and individual materials with inventory less than the goal. Of these, 11 goals are over 50 percent filled.

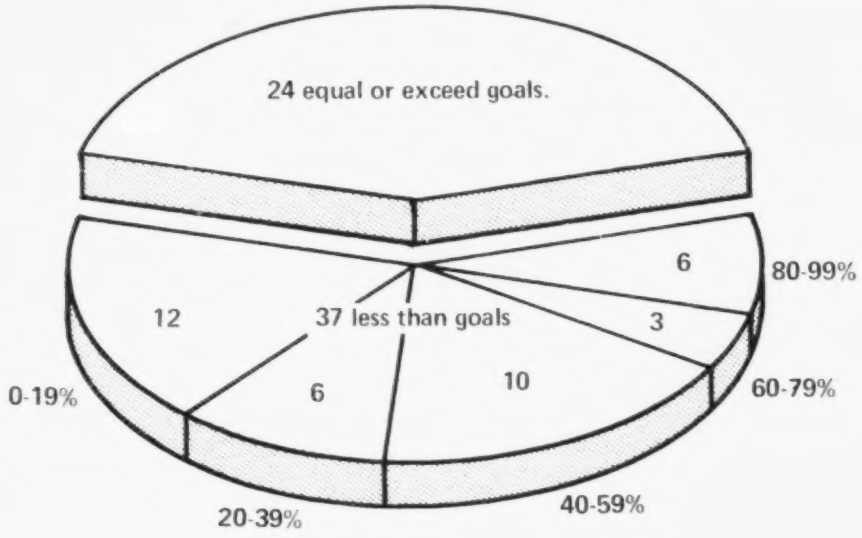

Figure 2

Status of the 61 family groups and individual materials in the stockpile inventory toward meeting the 1980 goals.

Annual Materials Plan

Presidential guidance and recent legislative amendments to the Strategic and Critical Materials Stock Piling Act require a planning process for restructuring the stockpile through the Annual Materials Plan (AMP). The AMP is a list of stockpile materials proposed for acquisition and disposal developed each year through an interagency committee chaired by FEMA. The agencies represented on the Annual Materials Plan Steering Committee are the Departments of Defense, Commerce, the Interior, Energy, Agriculture, State, and Treasury, the Central Intelligence Agency, the General Services Administration, and the Office of Management and Budget. The AMP process begins when FEMA develops a preliminary proposed list of materials for purchase and/or sale and selected according to national security priorities. This list is given to the General Services Administration which makes an initial assessment of the market for these materials and determines the quantities that could be bought and/or sold without undue disruption of usual markets. After these market constraints are added, the list is given to the AMP subcommittees for review.

The Strategic Implications Subcommittee, chaired by the Department of Defense, determines the impact of changes in defense requirements. The International Economic and Political Impacts Subcommittee, chaired by the Department of State, determines the impact of AMP proposals on international producers, trade agreements, and foreign producer countries. The Market Impact Subcommittee, chaired by the Department of Commerce, examines

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the effect on commodity markets and develops the market impact statements. The Economic and Budgetary Impact Subcommittee, chaired by FEMA, examines the revenue and cost projections of the AMP proposal.

After the recommendations from the subcommittees have been incorporated, the AMP is reviewed by all member agencies. Upon inclusion of approved revisions, the Director of FEMA submits the AMP to the National Security Council and simultaneously provides a copy to the Office of Management and Budget. Any further revisions are made jointly by the National Security Council, the Office of Management and Budget and the Federal Emergency Management Agency.

The AMP for fiscal year 1982 was transmitted to the Armed Services Committees. This plan contains cash acquisition proposals for the range of expected appropriations, proposals to barter agricultural products, and proposals to exchange excess stockpile materials for needed ones. Provision is also made for rotation of deteriorating materials and for testing the long term storage characteristics of materials.

In addition to the 1982 plan, a 5-year AMP for fiscal years 1983-1987 was submitted. The disposal estimates in this 5-year plan are the quantities and materials authorized in the Budget Reconciliation Act of 1981, together with estimates for sales of materials previously authorized for disposal. Acquisitions over the 5-year period would involve about 20 of the most urgently needed materials. As in 1982, these acquisitions are expected to combine cash purchase, barter, and exchange. The materials and associated quantities remain classified until invitations to bid are announced.

Legislation

During the report period, legislation was introduced in both Houses of the Congress, and hearings were held by five committees on various aspects of the stockpile program.

On October 26, 1981, a hearing was held by the Senate Committee on Banking, Housing and Urban Affairs on the use of the authorities contained in Title III of the Defense Production Act to stimulate domestic production of cobalt. The Senate Armed Services Committee, Subcommittee on Preparedness, held a hearing on December 14, 1981, as a continuation of its June 17 and 19 hearings, to consider various proposals regarding silver and tin disposals and the purchase of metallurgical bauxite.

The Department of Defense Appropriation Act was amended to stop the sale of stockpile silver (Public Law 97-114, signed by the President on December 29, 1981). This Act requires the President to review silver requirements by July 1, 1982, taking into consideration, among other factors, the following:

(1) the findings and recommendations of the General Accounting Office report on silver sales;

(2) the demand for silver to meet defense, essential civilian, basic industrial, and monetary requirements, taking into account the most recent Department of Defense scenario, as well as historical monetary uses of silver to pay foreign workers during emergencies;

(3) the projected magnitude of wartime domestic and reliable foreign production increases, including estimates of necessary leadtimes and resources required;

(4) the reliability of supplies from foreign sources and the economic and security implications, including probability of supply disruption or price increase; and

(5) the need for silver over the next ten years using the Bureau of Mines long-term supply and demand projections.

In addition, if the President determines that silver is excess to stockpile needs, he is required to report to the Armed Services Committees of both Houses of the Congress alternative methods of disposal for the silver, together with his recommended method of disposal.

The Departments of Defense, Commerce, State and the Interior furnish the basic data used to estimate stockpile goals. For example, to assist the President

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in his determination of silver requirements. FEMA has obtained silver consumption data from the Department of Commerce, and war scenarios with corresponding defense expenditure patterns from the Defense Department. These are being used in an updated macroeconomic model of the United States wartime economy which is used to derive estimates of wartime silver consumption. The Bureau of Mines has provided estimates of domestic and foreign production of silver for all war years. Bureau of Mines estimates of annual silver production by country take into account the type of wartime supply determinants required in (3) above. The State Department's country political reliability data are used by FEMA to discount foreign silver supplies for the type of considerations in (4) above.

Separate silver demand and supply estimates are derived by FEMA for defense, essential civilian and basic industrial sectors for each of the war years (2, above). Stockpile goals are created when demand exceeds supply in any sector for any year.

An Interagency Silver Commodity Committee, formed to assist in the development of alternative methods of disposal, also will evaluate the findings of the General Accounting Office report (1, above) and the need for silver over the next ten years (5, above). The Treasury Department provided an analysis of historical monetary wartime uses of silver (2, above), and the Interagency Committee is evaluating silver's uses for currency or numismatics and as wartime wage payments to allies. In addition, the options discussed in the report of the General Accounting Office for disposal methods are being analyzed.

This Interagency Silver Committee has representatives from the following departments and agencies: the Departments of Defense, Commerce, Interior, State, Treasury, the General Services Administration, the Council of Economic Advisors, the Central Intelligence Agency, the United States Trade Representative, the Commodity Futures Trading Commission, the International Trade Commission, the Office of Management and Budget, and the Federal Emergency Management Agency.

The Subcommittee on Mines and Mining of the House Committee on Interior and Insular Affairs held a hearing on February 4, 1982, regarding the effect of declining industrial processing capacity on national security. Changes in domestic capacity can have important implications for the stockpile since each ton of lost domestic capacity not compensated by other factors results in an increase of three tons in the stockpile goal. An increase in stockpiling of upgraded forms, or a need to stockpile by-products not presently stockpiled, may also result from a decline in domestic processing capacity.

The House Committee on Appropriations, Subcommittee on Treasury, Postal Service, General Government held hearings on March 16, 1982, to consider funding for the National Defense Stockpile Transaction Fund. The President's budget for fiscal year 1983 contains $120 million for purchase of strategic and critical materials for the stockpile. This item appears in the General Services Administration's budget.

On March 23, 1982, the House Banking, Finance and Urban Affairs Committee, Subcommittee on Economic Stabilization, held a hearing on H.R. 5540, a bill to amend the Defense Production Act. This bill would extend the Act for five years and would provide financial assistance under Title III to small and medium-sized businesses to modernize industries necessary for the manufacture of defense materials, especially expansion of domestic production capacity of strategic and critical materials. In addition, this legislation calls for grants to States to train, retrain and upgrade skills of workers in defense-related industries; establishes a grant program for colleges and universities to purchase equipment; and provides authorization of funds to carry out the programs.

At the close of the report period, the Senate Armed Services Committee, Subcommittee on Preparedness, was expected to hold hearings on S. 1982. This bill would establish a Stockpile Commission to oversee the stockpile program including policy planning and management functions presently located in FEMA and GSA as well as Title III Defense Production Act projects.

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Revision of Data

Presidential and Congressional planning guidance calls for a stockpile capable of supporting the United States military, industrial, and essential civilian needs for three years during a national emergency. Presidential guidance contains detailed assumptions regarding changes in a wartime civil economy, wartime foreign trade patterns, shipping losses, wartime political and economic stability of foreign nations, and alternate foreign and domestic production levels for stockpile materials. These guidelines are incorporated into the econometric model used to estimate stockpile goals. Data used in this model cover many areas, such as consumption, production, capacity, imports and exports, and is revised frequently to ensure that a current estimate will be available.

The Department of Commerce prepares annual domestic consumption analyses of each stockpile material. Supply data for 26 materials and domestic capacity data for 27 materials also are provided each year. In addition, other supply and capacity studies are provided by the Bureau of Mines. These studies are essential for determination of stockpile goals. Within the Department of Commerce, responsibility for preparation of these analyses rests with the Bureau of Industrial Economics (BIE). Guidelines to be followed by the BIE analysts in preparation of stockpile data, as well as quality control, are provided by the Industry and Trade Administration's Office of Industrial Resource Administration.

A portion of the domestic consumption analysis for cobalt is shown in Table 1 as an example of these annually prepared analyses of stockpile materials. The total amount of cobalt consumed in any one year is the quantity reported by the Bureau of Mines in their publication *Minerals Yearbook*. The end use allocation is determined by Bureau of Industrial Economics analysts using the 4-digit Standard Industrial Classification (SIC) Code. End use categories for cobalt include 33 different SIC Codes of which only 6 are shown in Table 1. These patterns of consumption are developed through use of Bureau of Census documents, industry contacts, and research.

Consumption data are prepared using statistical techniques to ensure consistency of the data base over the years covered. If any changes are made in the consumption pattern used to develop the statistics, the change is made, as necessary, in each preceding year. This makes possible comparisons between yearly patterns to determine trends that exist over previous years.

Of particular interest in the cobalt consumption analysis is the trend of consumption for certain applications. As can be seen in Table 1, consumption increased, or remained relatively steady, in some critical areas—SIC Code 3511: turbines and turbine generator sets; 3519: internal combustion engines; 3549: metalworking machinery; and 3724: aircraft engines and engine parts. This trend occurred even in the face of large price increases. At the same time, however, consumption declined in other uses where cobalt is not essential—SIC Code 3253: ceramic wall and floor tile—or where substitutions were acceptable—3662: radio and television communications equipment. The result is a slight decrease in total cobalt consumption. Because the increases occur in critical uses, despite decreases in some nonessential areas, a trend appears to exist indicating that the stockpile goal for cobalt may increase even though there is a slight decrease in actual total consumption.

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TABLE 1
CONSUMPTION ANALYSIS — COBALT
(Thousands pounds of contained cobalt)

1972 SIC Code	Application	1972R[1]	1973R	1974R	1975R	1976R	1977R	1978R	1979R	1980
3253	Ceramic Wall & Floor Tile	532	705	717	567	787	746	1,064	352	276
3511	Turbines & Turbine Generator Sets	301	328	408	225	278	371	430	527	629
3519	Internal Combustion Engines	151	164	205	113	139	186	215	264	314
3549	Metalworking Machinery	180	296	360	256	250	249	371	282	316
3662	Radio & TV Communication Equipment	1,160	1,411	1,148	683	1,171	992	1,110	939	660
3724	Aircraft Engines & Engine Parts	2,448	2,658	3,311	1,841	2,262	3,044	3,574	4,358	5,075
----	All Other[2]	9,358	13,179	12,712	9,102	11,595	10,989	13,230	10,680	8,051
	Totals	14,130	18,741	18,861	12,787	16,482	16,577	19,994	17,402	15,321

1/ "R" indicates that the data have been revised for consistency.

2/ "All Other" combines 27 SIC Codes of cobalt uses that are shown individually in the actual consumption analysis.

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Research and Development

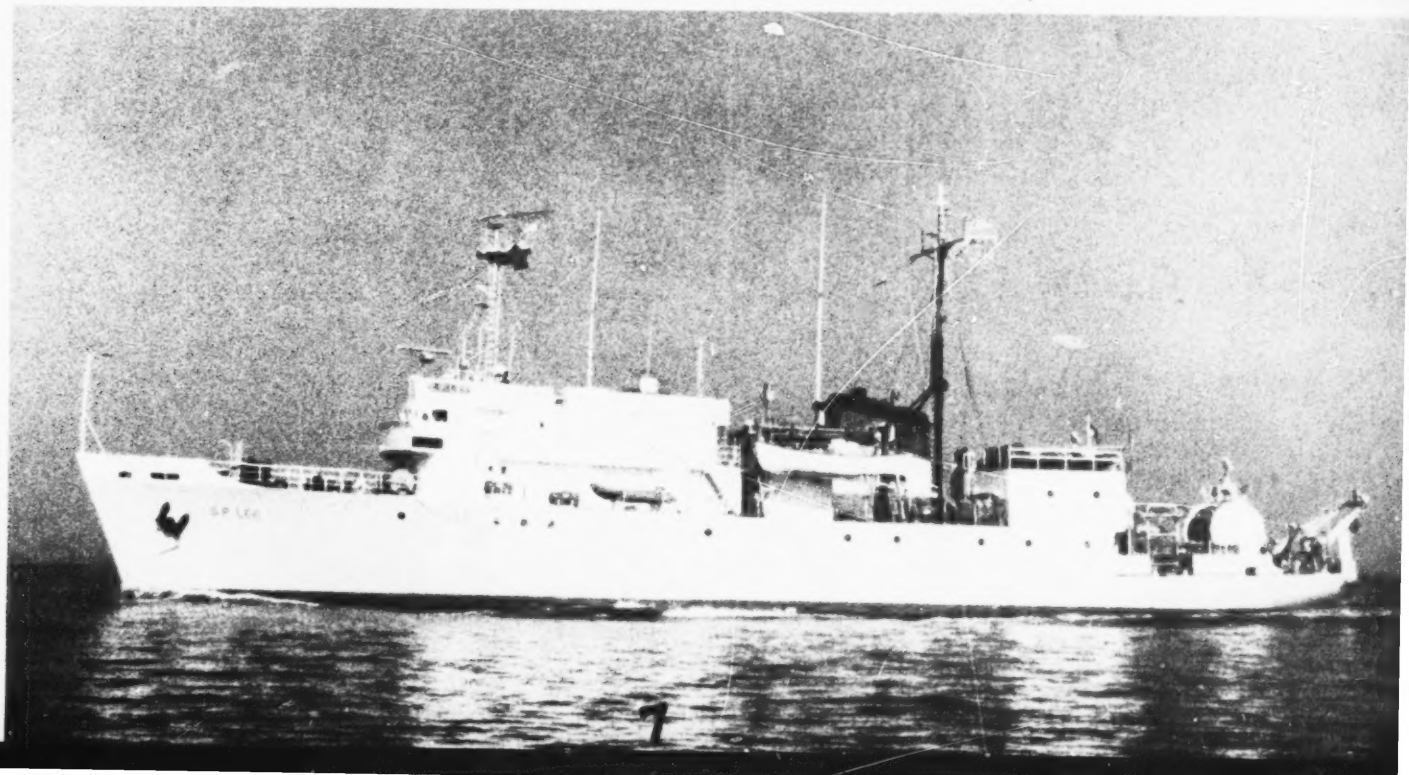
An alternative to stockpiling of strategic and critical materials is the development of domestic sources of supply. Additions to, or establishment of, domestic supply sources make possible a decrease in the stockpile goals. Therefore, research of a scientific, technologic and/or economic nature to develop domestic production or substitutes for strategic and critical materials is a continuing part of the stockpile program.

During the report period, the United States Geological Survey and Bureau of Mines cooperatively published a paper on copper reserve and resource data. A map relating the origin of ore deposits of North America was also published that shows locations and summary data on over 1,000 mines and deposits. The Bureau of Mines completed *Mineral Perspectives of Latin America*, the most recent of seven reports covering the world. These provide maps showing mineral location and transportation facilities for each country, plus a summary of the mineral supply position of each.

In connection with access to alternate supplies, a prototype international strategic minerals inventory was undertaken by the Geological Survey with the Bureau of Mines, and mineral agencies of Canada, Germany, and South Africa. Participants in this inventory are compiling major mine and deposit data on a worldwide basis for chromium, nickel, manganese, and phosphate. Knowledge of worldwide deposits is being used by the U.S. Geological Survey to develop conceptual deposit models that can be used by industry to explore for new types of domestic deposits of chromium, nickel and manganese.

Massive polymetallic sulfide mineral deposits (primarily zinc, copper and silver) and associated hot water springs were discovered by U.S. Geological Survey scientists in August 1981 along the Juan de Fuca Ridge about 275 nautical miles off the coast of Oregon. Similar deposits were found on the East Pacific Rise off Mexico, Central and South America. The mineral formation is associated with new ocean crust at the crest of these ridges which are a part of the world-encircling mid-ocean ridge systems. The magnitude of these deposits on a worldwide basis may be enormous, inasmuch as massive sulfide deposits on land are known to be prominent features in complexes of Oman, Cyprus, Turkey, Italy, Canada, the Philippines, India and the Soviet Union.

Ships like the "S. P. Lee"—on loan to the U. S. Geological Survey from the Navy—have been used in the discovery of several important undersea mineral deposits in the Western Hemisphere.



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Availability of a portable crusher for underground mining applications will improve the efficiency of most conveyor systems and make it possible to bring conveyor haulage closer to rock handling locations. Bureau of Mines research resulted in design, construction, and surface testing of a full-scale portable, low-profile, hardrock crusher. Underground testing of the crusher is in progress to complete the transfer of this technology to the mining industry.

Refractories are vital to virtually every industry in which high temperatures are required, but the most temperature-resistant refractories are used, in significant volumes, in pyrometallurgical, cement making and glassmaking processes in which the performance requirements are severe and the possibilities for substitution are limited. High temperature alumina refractories employ substantial amounts of imported refractory-grade bauxite. To help reduce industry's dependence on refractory-grade bauxite, which is imported from Guyana and the Peoples Republic of China, the Bureau of Mines is assessing domestic resources that could be economically upgraded to substitute for imported materials. While the United States has a limited amount of bauxite resources, there is not enough high quality domestic bauxite to meet the refractory industry's needs. An assessment of other potential domestic resources includes saprolite ores from Alabama, North Carolina, and Virginia; gibbsite sands from the Gulf coast; kaolin from Georgia; and products from secondary aluminum drosses (waste materials). All of these approaches are being investigated in close coordination with the refractories industry.

This low-profile portable crusher developed by the Bureau of Mines will improve the efficiency of most conveyor systems and make it possible to bring conveyor haulage closer to rock handling locations.

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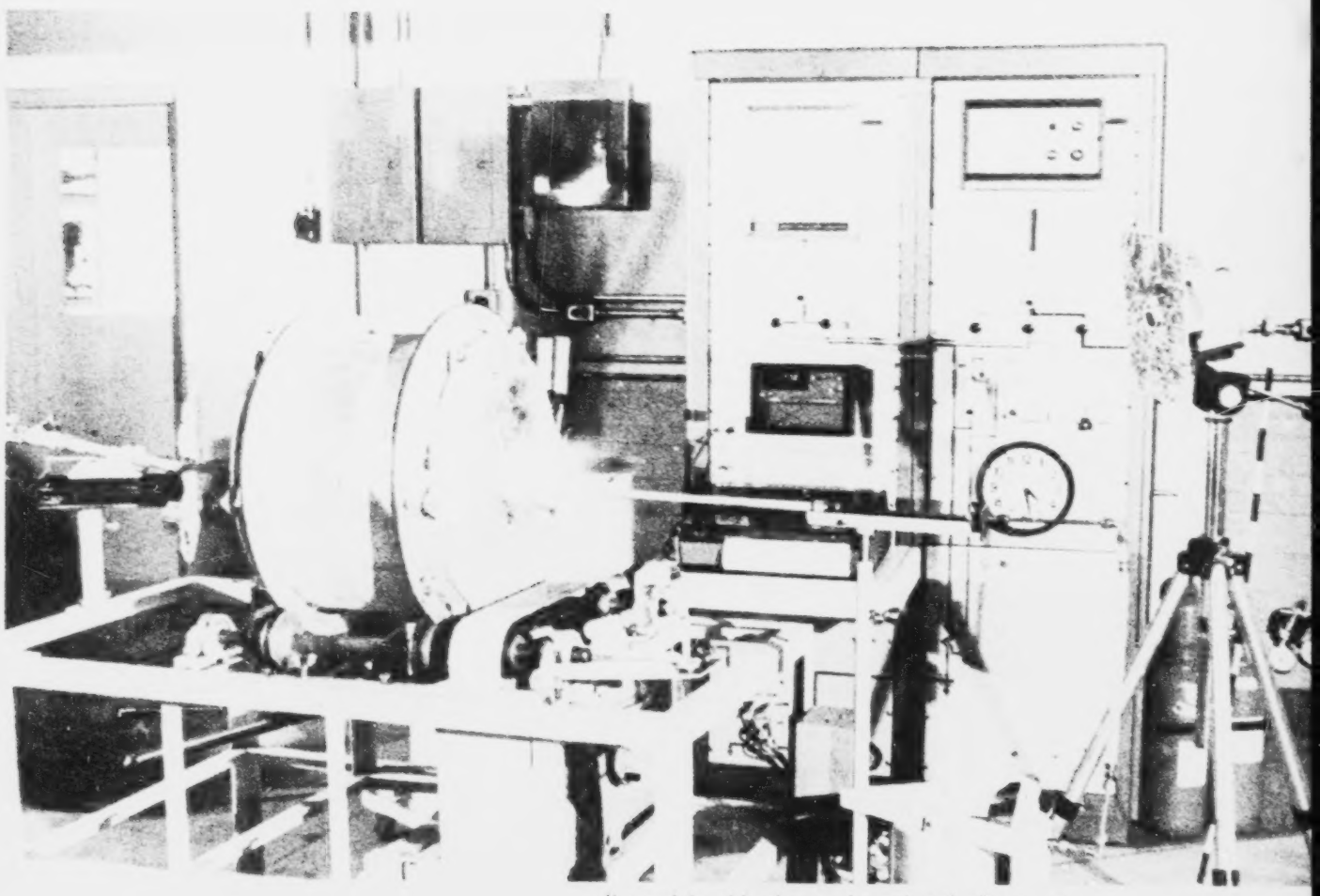

Rotary kilns, like this one located at the Bureau of Mines Research Center in Tuscaloosa, Alabama, are used to test refractories.

The Department of Defense has been involved in the development of composite materials for almost 20 years. Composites are man-made materials composed of two or more components and have properties that are different from those of either component. A composite usually consists of a series of strong, stiff reinforcing fibers embedded in a plastic, metal, or carbonaceous matrix. Carbon-carbon composites are defined as arrays of carbon fibers imbedded in a carbonaceous matrix. The carbon fiber array may be in the form of woven sheets and/or two- or three-dimensional constructions. Metal matrix composites are a broad class of filamentary, particulate, or whisker-reinforced metals. These types of reinforcements include a series of compatible, continuous or discontinuous fibers such as graphite, silicon carbide, or aluminum oxide incorporated in to structural metals (e.g., aluminum, magnesium, titanium, copper, superalloys) to significantly improve the structural properties of the base metal.

The Navy has investigated numerous applications for metal-matrix composites. In tactical missile structures, substitution of metal-matrix composites for steel in systems such as the supersonic tactical missile can provide weight savings up to 67 percent for some components. Analysis indicates that these weight savings can be used to increase missile range and/or launcher survivability, and will aid in solving difficult center of gravity problems by substituting metal-matrix composites in all components such as missile fins.

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For air and submarine-launched torpedoes, the decrease in shell thickness and size of stiffeners afforded by metal-matrix composites will permit increased depth capability, provide more internal volume, increase propulsion efficiency, and improve warhead effectiveness. The use of both carbon/carbon composites as a heat shield material and metal-matrix composites as a substructure can provide an improved substructure/thermal protection system for advanced reentry vehicles. The higher allowable-service temperature of the metal-matrix composites permits the use of a thermally conductive carbon/carbon composite heat shield. Resultant weight reductions can be used to increase range, or warhead weight or for vehicle hardening.

Working with the Defense Advanced Research Projects Agency, the Air Force has developed a class of dimensionally stable metal-matrix composites for spacecraft applications. The combination of near zero thermal expansion and exceedingly high unidirectional specific modulus greatly increases the efficiency of space structures such as antennas and support booms. This concept, involving very high modulus graphite fiber reinforced aluminum or magnesium is now being investigated by the National Aeronautics and Space Administration for waveguides as well as space structures. The Navy is investigating the use of metal-matrix composites in high energy laser mirrors. A weight reduction of over 400 percent appears possible compared with the current molybdenum optics.

A significant outcome of this program is the potential for substitution of metal-matrix composites for critical or long lead time materials such as chromium, cobalt, titanium, and beryllium. For example, it has been determined that high modulus graphite fiber reinforced magnesium alloy composites exhibit stiffness, strength and dimensional stability properties equivalent to or superior to those of beryllium at the same weight. In another case, titanium sheet clad graphite fiber reinforced aluminum alloy composite material has demonstrated structural properties comparable to a solid sheet of titanium one and one-half times thicker using only seven-percent titanium. This composite can save as much as 93 percent of the titanium conventionally used. All of these fiber reinforcements are domestically produced. Consequently, in composite materials development, a great deal of attention is being given the potential for substitution for strategic and critical materials.

Management

Executive Order 12155 delegates responsibility for the management of the day-to-day operations of the National Defense Stockpile to the Administrator of General Services. Within the General Services Administration (GSA), the Federal Property Resources Service (FPRS) is assigned stockpile activities: market analysis, buying and selling stockpile materials, managing stockpile funds and budgets, storage, quality assurance, shipping, inspection, maintenance and security of the physical inventories.

During this report period, shipments of cobalt, refractory grade bauxite, tantalum pentoxide, quinidine sulfate, and iridium were inspected and accepted into the stockpile. A commodity quality assessment survey is under way for specific materials presently in the stockpile. Selected commodities are those subject to deterioration or those of indeterminate quality due to significant specification changes since the materials were acquired. Materials selected for the initial sampling, analysis, and evaluation are quinidine sulfate, titanium, tungsten and cobalt.

Purchase Guidelines

The Interagency Committee for Stockpile Purchase Specifications and Special Instructions, chaired by the Department of Commerce, Office of Industrial Resource Administration, has representation from the Departments of Defense, Interior (Bureau of Mines), Agriculture, State, Commerce (National Bureau of Standards and Bureau of Industrial Economics), the General Services Administration (Office of Stockpile Management), and the Federal Emergency Management Agency.

Since the inception of the Committee in 1976, it has developed, reviewed and approved the publication

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of Purchase Specifications and Special Instructions covering 15 materials. During this report period, the Committee approved Purchase Specifications for chrysotile asbestos, rutile, and bauxite (metal grade, Jamaica type), and a Special Instructions document for rutile. The Committee has under review Purchase Specifications and Special Instructions documents for nickel, castor oil, quinidine sulfate, technically specified hevea rubber, and titanium.

Purchases

The Government-owned William Langer Jewel Bearing Plant located at Rolla, North Dakota, produces jewel bearings for sale to the stockpile and to defense contractors. Jewel bearings and related items ordered from the plant during the report period totaled 919,599 units. Orders from Defense contractors for related items totaled 15,063 units. The plant was operated at a loss during the report period partly because of the sharp decline in orders from Defense contractors for watch jewel bearings. The plant has been directed to undertake a project for the manufacture of dosimeters, a radiation measuring device. This project is funded by FEMA and is being implemented through the Defense Civil Preparedness Office of the Defense Logistics Agency. The project is executed by the plant as a special related item order from the Defense Logistics Agency. Manufacturing is scheduled to begin in November 1982.

During the report period, a contract was awarded Cometals, Inc., to supply 25,000 tons of refractory grade bauxite. This is a type of bauxite, high in alumina content, used to manufacture refractory products for high heat and metallurgical processes. This bauxite was the first delivered from China for the stockpile.

Basic Ordering Agreements (contracts complete except for prices) have been signed with several suppliers of iridium to provide for individual procurement actions to take quick advantage of market opportunities at any time during the period of the agreement. Quantities and delivery periods depend on funds available during the fiscal year, and the agreement with individual firms is subject to review annually. As of March 31, 1982, orders had been placed for 2,250 troy ounces of iridium.

Plans were announced to buy up to 61,050 pounds of tantalum. Industry proposals were received, and an award was made to Nororc Corporation to furnish 30,630 pounds of material.

A contract was awarded on December 15, 1981, to R. W. Greeff, Inc., for about 75,000 ounces of quinidine sulfate. This material is produced from quinine which comes from the bark of the cinchona tree and is grown principally in Indonesia and Africa. It is a medicinal used to control irregular heartbeat.

Barter/Exchange

A Memorandum of Agreement with the Government of Jamaica was signed on February 25, 1982, to acquire 1,200,000 long dry tons of bauxite. An additional 100,000 long dry tons of bauxite will be furnished under a barter agreement between the Commodity Credit Corporation in the United States Department of Agriculture and Jamaica. Based on a Presidential directive issued in November 1981, this acquisition was a joint General Services Administration/United States Department of Agriculture effort to acquire a total of 1.6 million tons of bauxite from Jamaica for cash, exchange of excess strategic and critical materials, and barter of surplus milk-based agricultural products for a total value of $67.5 million. This is the first agreement of this type.

Between 1950 and 1967 the United States Department of Agriculture (USDA) conducted a barter program under which approximately 60 strategic materials, with a value of over $1.2 billion, from more than 50 different countries were added to the stockpile in exchange for agricultural commodities owned by the Commodity Credit Corporation. The last barter contract under that program was signed in 1967.

The barter method of acquisition requires close coordination between the USDA, GSA, and the buyer.

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The agreement requires first that the USDA and the buyer agree upon what agricultural commodity will be used as payment material and at what price; second, GSA and the buyer reach agreement on the price and other terms of acquisition of the strategic and critical materials; and third, all parties must agree with all of the terms and conditions.

The barter portion of the agreement was negotiated by the Office of the General Sales Manager, Foreign Agricultural Service, USDA, representing the Government of the United States, and the Bauxite and Alumina Trading Company, Ltd., representing the Government of Jamaica. Since the negotiations involved a government-to-government bilateral arrangement, many of the complex and technical requirements in previous barter programs were avoided. In addition, the negotiations were made less complicated because the directive issued by President Reagan provided the broad guidelines within which the negotiation was to be conducted.

The negotiations involved several meetings between officials of the USDA and the Bauxite and Alumina Trading Company. First, agreement was reached on the kind of agricultural commodities to be bartered—dairy products. Next, the value to be placed on the dairy products, quality specifications, delivery periods and other usual terms involved in the export of agricultural commodities, were agreed upon. The quantity of dairy products was decided at the time GSA reached an agreement on the value of the bauxite.

To assist in the course of negotiations, the Bureau of Mines made a special survey of current United States bauxite imports and provided interpretation of technical information on bauxite composition, production and processing. Representatives from the Department of State played an important role in the initial planning stages of this acquisition, and the United States Embassy in Jamaica worked closely with host government officials to coordinate details of the agreement.

Under the terms of the final agreement, 9,115 metric tons of dairy products will be bartered for 400,000 tons of bauxite. The total value of the dairy products and bauxite was set at $13 million (excluding transportation and materials handling). Under the arrangements made between GSA and USDA, GSA will purchase the bauxite from the Commodity Credit Corporation no later than the end of fiscal year 1983, and the Corporation retains title to the bauxite until then. In addition, all transportation and storage costs for the bauxite will be funded from GSA budgets.

Under the exchange provisions of the agreement, GSA will pay for approximately $18 million worth of bauxite with excess stockpile materials. GSA will sell the excess materials on behalf of Jamaica, receiving a two percent commission for its efforts. Existing disposal systems and procedures will be used by GSA to sell these excess materials.

Sales

Sales from the National Defense Stockpile during the period October 1981—March 1982 totaled approximately $118.1 million. As shown in Table 2, thirteen materials were sold during the report period, including major sales of diamond stones, iodine, silver, tin, tungsten and vegetable tannin quebracho. All sales were for industrial use except a portion of the mercury valued at $72,209 that was sold for Government use.

Demand for industrial diamond stones held up well, given the current decline in industrial production. Sales of industrial diamond stones were 987,238 carats, valued at $11.7 million compared with 190,217 carats valued at $7.3 million during the last report period.

This is the first time since the beginning of the stockpile program that iodine has been authorized for disposal. Public Law 97-35 authorized the disposal of 2,213,000 pounds over a 3-year period. From October 1981 to March 1982, sales of iodine totaled 256,3333 pounds valued at $1.5 million. Iodine is facing lower international and domestic demand for many of its applications, and supplies are becoming less tight.

Mercury sales totaled 3,875 flasks for the report period. Sales of stockpile mercury under the Om-

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nibus Budget Reconciliation Act of 1981 (Public Law 97-35) totaled 2,375 flasks valued at $0.9 million. Sales of surplus mercury under the Federal Property and Administrative Services Act of 1949 amounted to 1,500 flasks valued at $0.6 million.

Congress authorized the sale of 105.1 million troy ounces of silver last year. During the report period, a series of weekly offerings resulted in the sale of 2 million troy ounces valued at $18.1 million. The silver sales were halted in December by the provisions of Public Law 97-114 (see Legislation section for details). Before the suspension of silver disposals, the Department of State was involved in an extensive dialogue with foreign producers concerning the alleged market disruption of such sales. State also arranged meetings between representatives of silver producing countries and GSA in an attempt to create a better understanding of market disruption provisions of U.S. legislation governing the disposal of excess stockpile materials.

GSA's decision to offer certain excess materials for international as well as domestic consumption resulted in a number of inquiries to the Department of State from foreign producers requesting details on disposal modification. Disposals of tin and tungsten remained unpopular with the producers.

Daily fixed-price sales of stockpile tin continued throughout the period. Sales totaled 6,950 tons valued at $108.2 million. The United States contributed 1,500 long tons of stockpiled tin to the International Tin Council Buffer Stock. The United States also announced in October that it would not join the Sixth International Tin Agreement which, if ratified, is due to take effect July 1, 1982.

Domestic demand for vegetable tannin quebracho has been falling since late 1981, and prices may be weakening since foreign sources of supply remain adequate. Sales of vegetable tannin quebracho for the period totaled 2,611 tons valued at $1.7 million. Approximately 89,065 long tons remain available for sale under previous authorization.

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TABLE 2
DISPOSAL OF NATIONAL DEFENSE STOCKPILE MATERIALS
October 1, 1981 — March 31, 1982

Material	Unit	Quantity Sold	Value (Dollars)	Balance of Disposal Authorization Quantity
Antimony	ST	—	—	3,000
Asbestos, Amosite	ST	—	—	25,393
Asbestos, Crocidolite	ST	—	—	831
Asbestos, Chrysotile	ST	—	—	6,849
Celestite	SDT	—	—	13,415
Diamond, Industrial Stones	KT	987,238	14,710,861	3,238,444
Diamond Industrial Crushing Bort	KT	—	—	1,692,817
Kyanite	SDT	—	—	1,187
Iodine	LB	256,888	1,497,979	1,955,910
Manganese Dioxide, Battery, Natural	SDT	—	—	78,782
Manganese Chemical Grade	SDT	—	—	51,045
Manganese, Metallurgical Grade	SDT	—	—	669,246
Mercury[1]	FL	2,375	919,869	47,625
Mercuric Oxide	LB	—	—	713,202
Mica, Muscovite Film 1st & 2nd quality	LB	—	—	150,000
Mica, Muscovite Block Stained & Lower	LB	—	—	150,000
Mica, Muscovite Splittings	LB	328,289	388,760	5,671,711
Mica, Phlogopite Splittings	LB	23,148	34,171	748,947
Quartz Crystals	LB	61,967	304,647	1,475,096
Rare Earth Oxide	SDT	—	—	488
Rubber (rotation)	LT	30	10,937	—
Silver[2]	TrOz	2,000,000	18,123,325	103,119,000
Talc, Block & Lump	ST	—	—	988
Talc, Ground	ST	—	—	1,089
Thorium Nitrate	LB	—	—	6,055,529
Tin	LT	6,950	108,240,928	25,936
Tungsten Ores & Concentrates	LB W	192,184	1,465,107	33,606,868
Vegetable Tannin, Chestnut	LT	474	297,209	6,617
Vegetable Tannin, Quebracho	LT	2,611	1,751,242	89,065
Vegetable Tannin, Wattle	LT	595	409,237	804
Total from National Defense Stockpile			$148,153,672	

[1]Sales under the Federal Property & Administration Services Act amounted to 1,500 flasks valued at $0.6 million.

[2]Sales halted pending reevaluation.

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Transaction Fund

GSA manages the National Defense Stockpile Transaction Fund into which all moneys from the sale of stockpile materials are placed. From its inception in fiscal year 1979 through March 31, 1982, a total of $339.8 million in sales receipts was placed in the Fund. The purchases of needed materials are financed from money appropriated by Congress from the Fund. Congress appropriated $100 million for fiscal year 1981 and $57.6 million for 1982, leaving an unappropriated balance of $182.2 million in cash receipts in the Fund. Of the $157.6 million in total appropriations, $134.9 million was obligated in purchase contracts at the close of the report period as indicated in the table below.

Material	Unit	Quantity	Value	Country of Origin
Bauxite, Metallurgical Grade	LDT	1,200,000	$50,688,000	Jamaica
Bauxite, Refractory Grade	LCT	25,000	3,825,000	China
Cobalt	LB	5,200,000	78,000,000	Zaire
Platinum, Iridium	TR OZ	2,550	1,076,000	South Africa
Quinidine Sulfate	OZ	74,075	232,000	Netherlands
Tantalum Minerals	LB TA	30,000	1,105,000	Various (foreign)
Total Obligations			$134,926,000	

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STOCKPILE INVENTORY

Explanation of Table 2

The National Defense Stockpile total inventory as given in Table 2 excludes quantities that were sold but not shipped from depots to the purchasers. In the Statistical Supplement (available from the General Services Administration) the inventory is listed as "Total Inventory in Storage" with a separate line for "Unshipped Sales."

The Table 2 inventory quantities combine stockpile and nonstockpile grade materials, while separate lines can be found for each type in the Statistical Supplement. Nonstockpile grade material may vary only slightly from the stockpile grade and in some cases is temporarily credited toward goals.

For some materials where a goal deficit occurs, the excess of another form of the material is held to offset the shortage as indicated in the footnotes at the end of Table 2. The term "offset" means allocating one form of a material for an equivalent amount of another form.

Materials are grouped by "families," and a summary line for each basic family group is included. The materials have been grouped in each family according to their status as raw materials, semifinished products or finished products that contain the same common ingredient. The values shown in the summary line for each family group are expressed in the basic unit common to all members of the group. In all but three cases, this basic unit is the metal equivalent for each form. There is a different conversion factor for each form because each requires different technology and incurs different conversion losses. The factors used for calculating these equivalent amounts and the calculation procedures are in Appendix 2.

Market values are prices at which comparable materials are being traded, or in the absence of trading, values are estimates. They are not necessarily the amount that would be realized if the material were sold.

Abbreviations

AMA Lb	- Anhydrous Morphine Alkaloid (Pounds)	LCT	- Long Calcined Ton
AvOz	- Avoirdupois Ounce	LDT	- Long Dry Ton
FL	- Flask (76-Pound)	LT	- Long Ton
KT	- Carat	MT	- Metric Ton
LB	- Pound	PC	- Piece
LB Cb	- Pounds of Contained Columbium	SDT	- Short Dry Ton
LB Co	- Pounds of Contained Cobalt	ST	- Short Ton
LB Mo	- Pounds of Contained Molybdenum	ST Ni+Co	- Short Tons of Contained Nickel plus Cobalt
LB Ta	- Pounds of Contained Tantalum	ST V	- Short Tons of Contained Vanadium
LB W	- Pounds of Contained Tungsten	TrOz	- Troy Ounces

Table 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS

March 31, 1982

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Deficit
1. Aluminum Metal Group	**ST Al Metal**	**7,150,000**	**3,444,064**	**629.8**		**3,705,936**
Alumina	ST	0	0	-		-
Aluminum	ST	700,000	1,733	2.7		698,267
Bauxite, Metal Grade, Jamaica Type	LDT	21,000,000	8,858,881	363.2		12,141,119
Bauxite, Metal Grade, Surinam Type	LDT	6,100,000	5,299,597	263.9		800,403
2. Aluminum Oxide, Abrasive Grain Group	**ST Ab Grain**	**638,000**	**259,124**	**128.6**		**378,876**
Aluminum Oxide, Abrasive Grain	ST	0	50,904	63.6	a	
Aluminum Oxide, Fused, Crude	ST	0	249,867	65.0	a	
Bauxite, Abrasive Grade	LCT	1,000,000	0	-		a
3. Antimony	**ST**	**36,000**	**40,729**	**162.9**	**4,729**	
4. Asbestos, Amosite	**ST**	**17,000**	**42,534**	**27.8**	**25,534**	
5. Asbestos, Chrysotile	**ST**	**3,000**	**9,958**	**9.0**	**6,958**	
6. Bauxite, Refractory	**LCT**	**1,400,000**	**174,599**	**38.4**		**1,225,401**
7. Beryllium Metal Group	**ST Be Metal**	**1,220**	**1,061**	**157.6**		**159**
Beryl Ore (11% BeO)	ST	18,000	17,987	22.8		13
Beryllium Copper Master Alloy	ST	7,900	7,387	73.0		513
Beryllium Metal	ST	400	229	61.8		171
8. Bismuth	**LB**	**2,200,000**	**2,081,298**	**5.2**		**118,702**
9. Cadmium	**LB**	**11,700,000**	**6,328,809**	**8.9**		**5,371,191**
10. Castor Bean Oil (Sebacic Acid)	**LB**	**22,000,000**	**12,524,243**	**9.4**		**b**
11. Chromium, Chemical and Metallurgical Group	**ST Cr Metal**	**1,353,000**	**1,324,921**	**1,063.0**		**28,079**
Chromite, Chemical Grade Ore	SDT	675,000	242,414	14.3		c
Chromite, Metallurgical Grade Ore	SDT	3,200,000	2,488,043	260.8		c
Chromium, Ferro, High Carbon	ST	185,000	402,696	294.5	c	
Chromium, Ferro, Low Carbon	ST	75,000	318,892	418.1	c	
Chromium, Ferro, Silicon	ST	90,000	58,355	43.3		c
Chromium, Metal	ST	20,000	3,763	32.0		c
12. Chromite, Refractory Grade Ore	**SDT**	**850,000**	**391,414**	**42.6**		**458,586**

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Table 2 (continued)

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Quantity After Crediting Offset Deficit
13. Cobalt	LB Co	85,400,000	40,802,305	510.0		44,597,695
14. Columbium Group	LB Cb Metal	4,850,000	2,510,528	30.9		2,339,472
Columbium Carbide Powder	LB Cb	100,000	21,372	.6		78,628
Columbium Concentrates	LB Cb	5,600,000	1,780,463	22.9		d
Columbium, Ferro	LB Cb	0	930,911	5.9	d	
Columbium, Metal	LB Cb	0	44,851	1.5	d	
15. Copper	ST	1,000,000	29,048	44.7		970,952
16. Cordage Fibers, Abaca	LB	155,000,000	0	-		155,000,000
17. Cordage Fibers, Sisal	LB	60,000,000	0	-		60,000,000
18. Diamond, Industrial Group	KT	29,700,000	40,952,009	469.6	11,252,009	
Diamond Dies, Small	PC	60,000	25,473	1.1		34,527
Diamond, Industrial, Crushing Bort	KT	22,000,000	23,692,817	47.4	1,692,817	
Diamond, Industrial, Stones	KT	7,700,000	17,246,456	421.1	9,546,456	
19. Feathers and Down	LB	1,500,000	0	-		1,500,000
20. Fluorspar, Acid Grade	SDT	1,400,000	895,983	161.3		504,017
21. Fluorspar, Metallurgical Grade	SDT	1,700,000	411,738	51.5		1,288,262
22. Graphite, Natural, Ceylon, Amorphous Lump	ST	6,300	5,499	10.7		802
23. Graphite, Natural, Malagasy, Crystalline	ST	20,000	17,903	35.8		2,097
24. Graphite, Natural, Other Than Ceylon & Malagasy	ST	2,800	2,804	2.0	4	
25. Iodine	LB	5,800,000	7,756,004	53.4	1,956,004	
26. Jewel Bearings	PC	120,000,000	70,423,653	75.4		49,576,347
27. Lead	ST	1,100,000	601,036	342.6		498,964
28. Manganese, Dioxide, Battery Grade Group	SDT	87,000	222,136	21.3	135,136	
Manganese, Battery Grade, Natural Ore	SDT	62,000	219,125	16.7	e	
Manganese, Battery Grade, Synthetic Dioxide	SDT	25,000	3,011	4.6		e

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Table 2 (continued)

	Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Excess	Offset Deficit
29.	**Manganese, Chemical & Metallurgical Group**	**ST Mn Metal**	**1,500,000**	**1,970,722**	**466.7**	**470,722**	
	Manganese Ore, Chemical Grade	SDT	170,000	221,044	18.1	51,044	
	Manganese Ore, Metallurgical Grade	SDT	2,700,000	3,370,104	186.1		f
	Manganese, Ferro, High Carbon	ST	439,000	599,978	262.5	f	
	Manganese, Ferro, Low Carbon	ST	0	0	-	-	
	Manganese, Ferro, Medium Carbon	ST	0	28,920	22.0	f	
	Manganese, Ferro, Silicon	ST	0	23,574	11.6	f	
	Manganese Metal, Electrolytic	ST	0	14,172	21.3	f	
30.	**Mercury**	**FL**	**10,500**	**189,016**	**74.2**	**178,516**	
31.	**Mica Muscovite Block, Stained & Better**	**LB**	**6,200,000**	**5,212,445**	**27.8**		**987,555**
32.	**Mica Muscovite Film, 1st & 2nd Qualities**	**LB**	**90,000**	**1,274,489**	**14.9**	**1,184,489**	
33.	**Mica Muscovite Splittings**	**LB**	**12,630,000**	**18,706,854**	**28.1**	**6,076,854**	
34.	**Mica Phlogopite Block**	**LB**	**210,000**	**130,745**	**.2**		**79,255**
35.	**Mica Phlogopite Splittings**	**LB**	**930,000**	**1,680,947**	**3.4**	**750,947**	
36.	**Molybdenum Group**	**LB Mo**	**0**	**0**	-	-	
	Molybdenum Disulphide	LB Mo	0	0	-	-	
	Molybdenum, Ferro	LB Mo	0	0	-	-	
37.	**Nickel**	**ST Ni+Co**	**200,000**	**32,210**	**211.9**		**167,790**
38.	**Opium Group**	**AMA LB**	**130,000**	**71,303**	**29.6**		**58,697**
	Opium, Gum	AMA LB	0	31,795	6.7	q	
	Opium, Salt	AMA LB	130,000	39,508	22.9		q
39.	**Platinum Group Metals, Iridium**	**Tr Oz**	**98,000**	**16,990**	**10.2**		**81,010**
40.	**Platinum Group Metals, Palladium**	**Tr Oz**	**3,000,000**	**1,255,003**	**156.9**		**1,744,997**
41.	**Platinum Group Metals, Platinum**	**Tr Oz**	**1,310,000**	**452,642**	**215.0**		**857,358**
42.	**Pyrethrum**	**LB**	**500,000**	**0**	-		**500,000**
43.	**Quartz Crystals**	**LB**	**600,000**	**2,066,140**	**12.4**	**1,466,140**	
44.	**Quinidine**	**Av Oz**	**10,100,000**	**1,800,436**	**5.5**		**8,299,564**
45.	**Quinine**	**Av Oz**	**4,500,000**	**3,246,164**	**7.2**		**1,253,836**

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Table 2 (continued)

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Excess	Offset Deficit
46. Rubber	**MT**	**864,000**	**120,557**	**125.5**		**743,443**
47. Rutile	**SDT**	**106,000**	**39,186**	**12.7**		**66,814**
48. Sapphire and Ruby	**KT**	**0**	**16,305,502**	**.2**	**16,305,502**	
49 Silicon Carbide, Crude	**ST**	**29,000**	**80,550**	**36.2**	**51,550**	
50. Silver, Fine	**Tr Oz**	**0**	**137,505,946**	**1,001.7**	**137,505,946**	
51. Talc, Steatite Block & Lump	**ST**	**28**	**1,092**	**.4**	**1,064**	
52. Tantalum Group	**LB Ta Metal**	**7,160,000**	**2,391,940**	**165.7**		**4,768,060**
Tantalum, Carbide Powder	LB Ta	0	28,688	4.7	h	
Tantalum Metal	LB Ta	0	201,133	44.2	h	
Tantalum Minerals	LB Ta	8,400,000	2,551,302	116.8		h
53. Thorium Nitrate	**LB**	**600,000**	**7,131,812**	**19.6**	**6,531,812**	
54. Tin	**MT**	**42,700**	**194,600**	**2,715.9**	**151,900**	
55. Titanium Sponge	**ST**	**195,000**	**32,331**	**458.8**		**162,669**
56. Tungsten Group	**LB W Metal**	**50,666,000**	**79,875,035**	**665.1**	**29,209,035**	
Tungsten Carbide Powder	LB W	2,000,000	2,032,942	30.2	i	
Tungsten, Ferro	LB W	0	2,025,361	24.8	i	
Tungsten, Metal Powder	LB W	1,600,000	1,898,911	26.4	i	
Tungsten Ores & Concentrates	LB W	55,450,000	86,859,955	583.7	i	
57. Vanadium Group	**ST V Metal**	**8,700**	**541**	**6.5**		**8,159**
Vanadium, Ferro	ST V	1,000	0	-		1,000
Vanadium Pentoxide	ST V	7,700	541	6.5		7,159
58. Vegetable Tannin Extract, Chestnut	**LT**	**5,000**	**15,920**	**10.4**	**10,920**	
59. Vegetable Tannin Extract, Quebracho	**LT**	**28,000**	**138,177**	**93.9**	**110,177**	
60. Vegetable Tannin Extract, Wattle	**LT**	**15,000**	**15,804**	**10.9**	**804**	
61. Zinc	**ST**	**1,425,000**	**378,320**	**293.2**		**1,046,680**

Offsets

a. **Aluminum Oxide, Fused Crude:** Hold 50,904 ST of aluminum oxide abrasive grain and 249,867 ST of aluminum oxide fused crude as offset against 379,253 LCT of bauxite abrasive grade.

b. **Castor Bean Oil:** sebacic acid inventory is credited toward castor bean oil goal at the rate of 2.5 to 1.

c. **Chromium Group, Chemical and Metallurgical Grades:** metallurgical grade ore goal is 3,200,000 SDT of specification grade; inventory 1,956,824 SDT; shortfall 1,243,176 SDT.

(1) Hold 217,695 ST of Fe Cr high carbon against shortfall of 544,238 SDT of specification grade ore.
(2) Hold 243,892 ST of Fe Cr low carbon against 609,730 SDT of specification grade ore.
(3) Hold 89,208 SDT of non-specification grade metallurgical ore against the balance of the 89,208 SDT specification grade ore shortfall.
(4) Hold 47,466 SDT of non-specification grade metallurgical ore against a shortfall of 31,644 ST of Fe Cr Si.
(5) Hold 56,830 SDT of non-specification grade metallurgical ore against a shortfall of 16,237 ST of chromium metal.
(6) Hold 337,715 SDT of non-specification grade metallurgical ore against 337,715 SDT of chemical grade ore shortfall.

d. **Columbium Group:**

(1) Hold 930,911 pounds Cb as Fe Cb against 1,095,189 pounds Cb as concentrates.
(2) Hold 44,851 lb Cb as Cb metal against 52,766 lb Cb as concentrates.

e. **Manganese, Dioxide, Battery Grade Group:**

Hold 21,989 SDT of manganese, battery grade, natural ore against a shortfall of 21,989 SDT of manganese, battery grade, synthetic dioxide.

f. **Manganese Group, Chemical and Metallurgical Grades:** metallurgical grade ore goal is 2,700,000 SDT; inventory 2,409,377 SDT; shortfall 290,623 SDT of stockpile grade ore.

(1) Hold 14,172 ST of Mn metal against 35,430 SDT of metallurgical ore.
(2) Hold 23,574 ST of Fe Mn Si against 42,433 SDT of metallurgical ore.
(3) Hold 28,921 ST of Fe Mn medium carbon against 57,842 SDT of metallurgical ore.
(4) Hold 77,460 ST of Fe Mn high carbon against 154,920 SDT of metallurgical ore.
(5) Hold remaining 83,518 ST of Fe Mn high carbon against reduction of ore value in desired inventory mix.

g. **Opium:** Hold 31,795 AMA lb of opium gum against 31,795 AMA lb of opium salt goal.

h. **Tantalum Group:**

(1) Hold 201,133 lb Ta as Ta metal against 237,337 lb Ta as concentrates.
(2) Hold 28,688 lb Ta as Ta C against 33,852 lb Ta as concentrates.

i. **Tungsten Group:**

(1) WC powder goal is 2,000,000 lb W; stockpile grade inventory 1,921,167 lb W; shortfall 78,833 lb W. Hold 111,775 lb W as non-specification grade WC to offset 78,243 lb W as WC specification grade (assume 70% recovery of usable W).

(2) W metal powder goal is 1,600,000 lb W; inventory stockpile grade 1,566,964 lb W; shortfall 33,036 lb W. Non-stockpile grade W metal powder inventory is 331,947 lb W. Assume 70% recovery as usable material, then 331,947 x .70 = 232,363 lb W. Hold 47,194 lb W as non-specification grade powder to offset shortfall of 33,036 stockpile grade W powder.

(3) Hold balance of non-stockpile grade W powder 232,363 - 33,036 = 199,327 lb W as powder against 234,209 lbs W as concentrate.

(4) Hold 840,752 lbs W as Fe W stockpile grade against 987,884 lb W as concentrate. Hold 1,184,609 lb W nonstockpile grade Fe W at 70 percent recoverable against 974,341 lb W concentrate.

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APPENDIX I

STRATEGIC AND CRITICAL MATERIALS STOCK PILING ACT

(50 U.S.C. 98 *et. seq.*)

SEC. 1. This Act may be cited as the 'Strategic and Critical Materials Stock Piling Act'.

FINDINGS AND PURPOSE

SEC. 2. (a) The Congress finds that the natural resources of the United States in certain strategic and critical materials are deficient or insufficiently developed to supply the military, industrial, and essential civilian needs of the United States for national defense.

(b) It is the purpose of this Act to provide for the acquisition and retention of stocks of certain strategic and critical materials and to encourage the conservation and development of sources of such materials within the United States and thereby to decrease and to preclude, when possible, a dangerous and costly dependence by the United States upon foreign sources for supplies of such materials in times of national emergency.

MATERIALS TO BE ACQUIRED: PRESIDENTIAL AUTHORITY AND GUIDELINES

SEC. 3. (a) The President shall determine from time to time (1) which materials are strategic and critical materials for the purposes of this Act, and (2) the quality and quantity of each such material to be acquired for the purposes of this Act and the form in which each such material shall be acquired and stored. Such materials when acquired, together with the other materials described in section 4 of this Act, shall constitute and be collectively known as the National Defense Stockpile (hereinafter in this Act referred to as the 'stockpile').

(b) The President shall make the determinations required to be made under subsection (a) on the basis of the following principles:

(1) The purpose of the stockpile is to serve the interest of national defense only and is not to be used for economic or budgetary purposes.

(2) The quantities of the materials stockpiled should be sufficient to sustain the United States for a period of not less than three years in the event of a national emergency.

(c) The quantity of any material to be stockpiled under this Act, as determined under subsection (a), may not be revised unless the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed revision and the reasons for such revision at least 30 days before the effective date of such revision.

MATERIALS CONSTITUTING THE NATIONAL DEFENSE STOCKPILE

SEC. 4. (a) The stockpile consists of the following materials:

(1) Materials acquired under this Act and contained in the national stockpile on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(2) Materials acquired under this Act on or after the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(3) Materials in the supplemental stockpile established by section 104(b) of the Agricultural Trade Development and Assistance Act of 1954 (as in effect from September 21, 1959, through December 31, 1966) on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(4) Materials acquired by the United States under the provisions of section 303 of the Defense Production Act of 1950 (50 U.S.C. App. 2093) and transferred to the stockpile by the President pursuant to subsection (f) of such section.

(5) Materials transferred to the United States under section 663 of the Foreign Assistance Act of 1961 (22 U.S.C. 2423) that have been determined to be strategic and critical materials for the purposes of this Act and that are allocated by the President under subsection (b) of such section for stockpiling in the stockpile.

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(6) Materials acquired by the Commodity Credit Corporation and transferred to the stockpile under section 4(h) of the Commodity Credit Corporation Charter Act (15 U.S.C. 714b(h)).

(7) Materials acquired by the Commodity Credit Corporation under paragraph (2) of section 103(a) of the Act entitled "An Act to provide for greater stability in agriculture; to augment the marketing and disposal of agricultural products; and for other purposes", approved August 28, 1954 (7 U.S.C. 1743(a)), and transferred to the stockpile under the third sentence of such section.

(8) Materials transferred to the stockpile by the President under paragraph (4) of section 103(a) of such Act of August 28, 1954.

(9) Materials transferred to the stockpile under subsection (b).

(b) Notwithstanding any other provision of law, any material that (1) is under the control of any department or agency of the United States, (2) is determined by the head of such department or agency to be excess to its needs and responsibilities, and (3) is required for the stockpile shall be transferred to the stockpile. Any such transfer shall be made without reimbursement to such department or agency, but all costs required to effect such transfer shall be paid or reimbursed from funds appropriated to carry out this Act.

AUTHORITY FOR STOCKPILE OPERATIONS

SEC. 5. (a) (1) Except for acquisitions made under the authority of paragraph (3) or (4) of section 6(a), no funds may be obligated or appropriated for acquisition of any material under this Act unless funds for such acquisition have been authorized by law. Funds appropriated for such acquisition (and for transportation and other incidental expenses related to such acquisition) shall remain available until expended, unless otherwise provided in appropriation Acts.

(2) If for any fiscal year the President proposes certain stockpile transactions in the annual materials plan submitted to Congress for that year under section 11(b) and after that plan is submitted the President proposes (or Congress requires) a significant change in any such transaction, or a significant transaction not included in such plan, no amount may be obligated or expended for such transaction during such year until the President has submitted a full statement of the proposed transaction to the appropriate committees of Congress and a period of 30 days has passed from the date of the receipt of such statement by such committees or until each such committee, before the expiration of such period, notifies the President that it has no objection to the proposed transaction. In computing any 30-day period for the purpose of the preceding sentence, there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than three days to a day certain.

(b) Except for disposals made under the authority of paragraph (4) or (5) of section 6(a) or under section 7(a), no disposal may be made from the stockpile (1) unless such disposal, including the quantity of the material to be disposed of, has been specifically authorized by law, or (2) if the disposal would result in there being a balance in the National Defense Stockpile Transaction Fund in excess of $1,000,000,000 or, in the case of a disposal to be made after September 30, 1983, if the disposal would result in there being a balance in the fund in excess of $500,000,000.

(c) There is authorized to be appropriated such sums as may be necessary to provide for the transportation, processing, refining, storage, security, maintenance, rotation, and disposal of materials contained in or acquired for the stockpile. Funds appropriated for such purposes shall remain available to carry out the purposes for which appropriated for a period of two fiscal years, if so provided in appropriation Acts.

STOCKPILE MANAGEMENT

SEC. 6. (a) The President shall—

(1) acquire the materials determined under section 3(a) to be strategic and critical materials;

(2) provide for the proper storage, security, and maintenance of materials in the stockpile;

(3) provide for the refining or processing of any material in the stockpile when necessary to convert such material into the form most suitable for storage and subsequent disposition;

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(4) provide for the rotation of any material in the stockpile when necessary to prevent deterioration of such material by replacement of such material with an equivalent quantity of substantially the same material;

(5) subject to the notification required by subsection (d)(2), provide for the timely disposal of materials in the stockpile that (A) are excess to stockpile requirements, and (B) may cause a loss to the Government if allowed to deteriorate; and

(6) subject to the provisions of section 5(b), dispose of materials in the stockpile the disposal of which is specifically authorized by law.

(b) Except as provided in subsections (c) and (d), acquisition of strategic and critical materials under this Act shall be made in accordance with established Federal procurement practices, and, except as provided in subsections (c) and (d) and in section 7(a), disposal of materials from the stockpile shall be made by formal advertising or competitive negotiation procedures. To the maximum extent feasible—

(1) competitive procedures shall be used in the acquisition and disposal of such materials;

(2) efforts shall be made in the acquisition and disposal of such materials to avoid undue disruption of the usual markets of producers, processors, and consumers of such materials and to protect the United States against avoidable loss; and

(3) disposal of such materials shall be made for domestic consumption.

(c)(1) The President shall encourage the use of barter in the acquisition of strategic and critical materials for, and the disposal of materials from, the stockpile when acquisition or disposal by barter is authorized by law and is practical and in the best interest of the United States.

(2) Materials in the stockpile, the disposition of which is authorized by law, shall be available for transfer at fair market value as payment for expenses (including transportation and other incidental expenses) of acquisition of materials, or of refining, processing, or rotating materials, under this Act.

(3) To the extent otherwise authorized by law, property owned by the United States may be bartered for materials needed for the stockpile.

(d)(1) The President may waive the applicability of any provision of the first sentence of subsection (b) to any acquisition of material for, or disposal of material from, the stockpile. Whenever the President waives any such provision with respect to any such acquisition or disposal, or whenever the President determines that the application of paragraph (1), (2), or (3) of such subsection to a particular acquisition or disposal is not feasible, the President shall notify the Committees on Armed Services of the Senate and House of Representatives in writing of the proposed acquisition or disposal at least thirty days before any obligation of the United States is incurred in connection with such acquisition or disposal and shall include in such notification the reasons for not complying with any provision of such subsection.

(2) Materials in the stockpile may be disposed of under subsection (a)(5) only if the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed disposal at least thirty days before any obligation of the United States is incurred in connection with such disposal.

(e) The President may acquire leasehold interests in property, for periods not in excess of twenty years, for storage, security, and maintenance of materials in the stockpile.

SPECIAL DISPOSAL AUTHORITY OF THE PRESIDENT

SEC. 7. (a) Materials in the stockpile may be released for use, sale, or other disposition—

(1) on the order of the President, at any time the President determines the release of such materials is required for purposes of the national defense; and

(2) in time of war declared by the Congress or during a national emergency, on the order of any officer or employee of the United States designated by the President to have authority to issue disposal orders under this subsection, if such officer or employee determines that the release of such materials is required for purposes of the national defense.

(b) Any order issued under subsection (a) shall be promptly reported by the President, or by the officer or employee issuing such order, in writing, to the

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Committees on Armed Services of the Senate and House of Representatives.

MATERIALS DEVELOPMENT AND RESEARCH

SEC. 8. (a)(1) The President shall make scientific, technologic, and economic investigations concerning the development, mining, preparation, treatment, and utilization of ores and other mineral substances that (A) are found in the United States, or in its territories or possessions, (B) are essential to the national defense, industrial, and essential civilian needs of the United States, and (C) are found in known domestic sources in inadequate quantities or grades.

(2) Such investigations shall be carried out in order to—

(A) determine and develop new domestic sources of supply of such ores and mineral substances;

(B) devise new methods for the treatment and utilization of lower grade reserves of such ores and mineral substances; and

(C) develop substitutes for such essential ores and mineral products.

(3) Investigations under paragraph (1) may be carried out on public lands and, with the consent of the owner, on privately owned lands for the purpose of exploring and determining the extent and quality of deposits of such minerals, the most suitable methods of mining and beneficiating such minerals, and the cost at which the minerals or metals may be produced.

(b) The President shall make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or for using agricultural commodities for the manufacture of any material determined pursuant to section 3(a) of this Act to be a strategic and critical material or substitutes therefor.

NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

SEC. 9. (a) There is established in the Treasury of the United States a separate fund to be known as the National Defense Stockpile Transaction Fund (hereinafter in this section referred to as the 'fund').

(b)(1) All moneys received from the sale of materials in the stockpile under paragraphs (5) and (6) of section 6(a) shall be covered into the fund. Such moneys shall remain in the fund until appropriated.

(2) Moneys covered into the fund under paragraph (1) shall be available, when appropriated therefor, only for the acquisition of strategic and critical materials under section 6(a)(1) of this Act (and for transportation related to such acquisition).

(3) Moneys in the fund, when appropriated, shall remain available until expended, unless otherwise provided in appropriation Acts.

(c) All moneys received from the sale of materials being rotated under the provisions of section 6(a)(4) or disposed of under section 7(a) shall be covered into the fund and shall be available only for the acquisition of replacement materials.

ADVISORY COMMITTEES

SEC. 10. (a) The President may appoint advisory committees composed of individuals with expertise relating to materials in the stockpile or with expertise in stockpile management to advise the President with respect to the acquisition, transportation, processing, refining, storage, security, maintenance, rotation, and disposal of such materials under this Act.

(b) Each member of an advisory committee established under subsection (a) while serving on the business of the advisory committee away from such member's home or regular place of business shall be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code, for persons intermittently employed in the Government service.

REPORTS TO CONGRESS

SEC. 11 (a) The President shall submit to the Congress every six months a written report detailing operations under this Act. Each such report shall include—

(1) information with respect to foreign and domestic purchases of materials during the preceding 6-month period;

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(2) information with respect to the acquisition and disposal of materials under this Act by barter, as provided for in section 6(e) of this Act, during such period;

(3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the fund during the next fiscal year; and

(4) such other pertinent information on the administration of this Act as will enable the Congress to evaluate the effectiveness of the program provided for under this Act and to determine the need for additional legislation.

(b) The President shall submit to the appropriate committees of the Congress each year with the Budget submitted to Congress pursuant to Section 201(a) of the Budget and Accounting Act, 1921 (31 U.S.C. 11(a)), for the next fiscal year a report containing an annual materials plan for the operation of the stockpile during such fiscal year and the succeeding four fiscal years. Each such report shall include details of planned expenditures for acquisition of strategic and critical materials during such period (including expenditures to be made from appropriations from the general fund of the Treasury) and of anticipated receipts from proposed disposals of stockpile materials during such period.

DEFINITIONS

SEC. 12. For the purposes of this Act:

(1) The term 'strategic and critical materials' means materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need.

(2) The term 'national emergency' means a general declaration of emergency with respect to the national defense made by the President or by the Congress.

IMPORTS

SEC. 13. Notwithstanding any other provision of law, on and after January 1, 1972, the President may not prohibit or regulate the importation into the United States of any material determined to be strategic and critical pursuant to the provisions of this Act, if such material is the product of any foreign country or area not listed as a Communist-dominated country or area in general headnote 3(d) of the Tariff Schedules of the United States (19 U.S.C. 1202), for so long as the importation into the United States of material of that kind which is the product of such Communist-dominated countries or areas is not prohibited by any provision of law.

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APPENDIX 2

CALCULATION PROCEDURE FOR FAMILY GROUPINGS OF MATERIALS

The following example is designed to help the reader perform and understand the conversions and calculations used in preparing summary lines for basic family groupings. The purpose in using basic units for each of the families or groups of materials is to place the content of the primary material into a common denominator for easier comparison.

In time of emergency, there would be a need for a mix of various forms of each metal element. The stockpile goal for a metal is a mix of products at various stages of upgrading. The goal is calculated by examining expected wartime requirements, availability, and domestic capacity to produce each of the upgraded forms.

There is a different factor for converting each of the forms into a common denominator, usually the basic metal equivalent. The conversion factors are different because process conversion losses vary. The calculations and conversions used for the aluminum oxide abrasive grain group are shown as an example.

The aluminum oxide abrasive grain group has a surplus of aluminum oxide abrasive grain and of aluminum oxide fused crude but has a deficit of bauxite abrasive grade. Both aluminum oxide abrasive grain and fused crude are used to offset the shortfall in the abrasive grade bauxite but in different proportions for each because of upgrading processing losses.

PROCEDURE

1. The available surplus of aluminum oxide abrasive grain is 50,901 ST. To calculate the abrasive grade bauxite equivalent, multiply by the conversion factor: 1.641026 times 50,901 equals 79,110 LCT of bauxite equivalent.

2. The available surplus of aluminum oxide fused crude is 249,867 ST. To convert this into bauxite equivalent multiply by the conversion factor: 1.833333 times 249,867 equals 299,840 LCT bauxite equivalent.

3. Add the two bauxite equivalents to find the total offset: 79,110 plus 299,840 equals 379,250 LCT.

4. The bauxite abrasive grade goal is 1,000,000 LCT; therefore subtract the offset of 379,250 LCT leaving a deficit of 620,750 LCT.

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Factors Used for Converting Materials Into Family Groups

Materials	Unit	Multiple Factor	Basic Family Unit
Alumina	ST	0.518	Metal Equivalent, Aluminum
Aluminum Oxide, Fused, Crude	ST	0.833	Aluminum Oxide, Abrasive Grain
Bauxite, Abrasive Grade[1]	LCT	0.641	Aluminum Oxide, Abrasive Grain S.T.
Bauxite, Metal Grade, Jamaica Type	ST	0.231	Metal Equivalent, Aluminum
Bauxite, Metal Grade, Surinam Type	ST	0.264	Metal Equivalent, Aluminum
Beryl Ore (11% BeO)	ST	0.028	Metal Equivalent, Beryllium
Beryllium Copper Master Alloy (4% Be)	ST	0.04	Metal Equivalent, Beryllium
Chromite, Chemical Grade Ore	ST	0.286	Metal Equivalent, Chromium
Chromite, Metallurgical Grade Ore	ST	0.286	Metal Equivalent, Chromium
Chromium, Ferro, High Carbon	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Low Carbon	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Silicon	ST	0.429	Metal Equivalent, Chromium
Columbium, Concentrates	LB	0.850	Metal Equivalent, Columbium
Diamond Dies, Small	PC	0.50	Carat
Manganese, Dioxide, Battery Grade	SDT	1.000	Manganese, Dioxide, Battery Grade, Synthetic
Manganese, Chemical Grade	ST	0.400	Metal Equivalent, Manganese
Manganese, Metallurgical Grade	ST	0.400	Metal Equivalent, Manganese
Manganese, Ferro, High Carbon	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Medium Carbon	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Silicon	ST	0.720	Metal Equivalent, Manganese
Opium Gum	AMA LB	1.000	Opium Salts
Tantalum Minerals	LB	0.85	Metal Equivalent, Tantalum
Tungsten Ores and Concentrates	LB	0.851	Metal Equivalent, Tungsten

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